

PATENT ABSTRACTS OF JAPAN

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(21)Application number : 08-106563 (71)Applicant : MINOLTA CO LTD

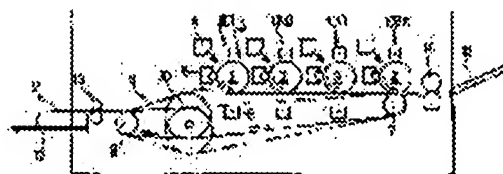
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(54) IMAGE FORMING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To switch between the pressure-contact of a carrying belt with an image carrier and its refraction therefrom when switching between monochromatic image formation and multicolor image formation, therefore, to extend the lives of the carrying belt and image carrier, and also to prevent transfer conditions from being impaired by the switch.

SOLUTION: To form a monochromatic image in specific color, the carrying belt 9 is displaced by a cam 10 around the shaft center of a transfer roller 7 serving as a transfer means for a specific-color image forming station I (Bk), thereby separating the carrying belt 9 from the image carriers 2 of the image forming stations 1 (C), 1 (M), and 1 (Y) other than the specific-color image forming station, and preventing a change in nip between the carrying belt 9 and the image carrier 2 of the specific-color image forming station 1 (Bk) before and after the displacement.



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PRIOR ART

[Description of the Prior Art] Although it is a best policy to stop image support, such as a photo conductor drum in the image formation station prepared for every color in the tandem process full color image formation equipment of monochrome combination, and the image support which is not used at the time of monochrome when the life of the conveyance belt which conveys imprint material is considered, and to make it evacuate from a conveyance belt, when an evacuation device is established about the image support of each image formation station, respectively, cost will start too much.

[0003] so, with the full color image formation equipment of the conventional monochrome combination For example, it sets to the image formation equipment which arranged the conveyance belt which passes through each image formation station and moves while arranging in parallel and arranging the image formation station of two or more colors as shown in JP,3-288173,A. Performing contact evasion of image support and a conveyance belt in the image formation station which does not participate in image formation at the time of monochrome image formation is proposed by supporting the whole conveyance belt by the cam, and changing the inclination by rotation of a cam.

[0004] Conventional image formation equipment is shown in drawing 3 . The imprint unit 22 common to each image formation station 21 (C), 21 (M), 21 (Y), and 21 (Bk) is arranged. The imprint material 28 fed from the feed unit 27 between the driving roller 24 arranged in the both ends of the imprint unit body 23, and the follower roller 25 Two or more image formation stations 21 (C), The conveyance belt 26 conveyed to a fixing assembly 29 through 21 (M), 21 (Y), and 21 (Bk) is ****(ed), and the imprint unit body 23 supports by the cams 30a and 30b of a pair from the bottom.

[0005] At the time of full color image formation, as Cams 30a and 30b are shown in drawing 3 , it stops at the same direction, and the conveyance belt 26 touches equally to the image support 31 of each image formation station 21 (C), 21 (M), 21 (Y), and 21 (Bk). When only cam 30a of the one distant from the image formation station 21 (Bk) of a specific color (black generally) is rotated 180 degrees of abbreviation at the time of monochrome image formation and cam 30b of another side leaves as it is By using the axis of a driving roller 24 (or follower roller 25) as the supporting point, the imprint unit 22 has an inclination and the conveyance belt 26 separates from the image support 31 of all the image formation stations 21 (C), 21 (M), 21 (Y), and 21 (Bk).

[0006] However, since the image support 31 of the image formation station 21 of a near specific color (Bk) and the clearance between the conveyance belts 26 are narrow, when the conveyance belt 26 is contacted by the image support 31 according to an operation of the backup strip 32 which carries out the operation which pushes the conveyance belt 26 against the image support 31, it consists of the supporting points so that an imprint may become possible.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] however, with the conventional image formation equipment mentioned above In the time of full color image formation and monochrome image formation, as a continuous line and an imaginary line show to drawing 4 , the conveyance belt 26 carries out rotation displacement a core [the axis of a driving roller 24]. And since the imprint location of the image support 31 in the image formation unit 21 of a specific color (Bk) has estranged only distance l from the axis of the driving roller 24, the nips of the image support 31 and conveyance belt 26 will differ delicately. Therefore, while tuning of imprint conditions was separately needed, since it was very important, nip management had the problem that highly precise tuning was required.

[0008] Furthermore, after a backup strip 32 is strong at the conveyance belt 26 rear face and forming the backup strip 32 which pushes the conveyance belt 26 against the image support 31 has carried out the pressure welding indispensable therefore, the conveyance belt 26 will move, and there was also a problem that the life of the conveyance belt 26 became short.

[0009] It aims at offering the image formation equipment which does not spoil imprint conditions by switch while this invention performs the pressure welding and evacuation change to the image support of a conveyance belt at the time of a switch of monochrome / multi-colored picture image formation, mitigates the load of a conveyance belt and image support in view of the above-mentioned conventional trouble and attains reinforcement.

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MEANS

[Means for Solving the Problem] In the tandem process full color image formation equipment of monochrome combination in order that this invention may attain the above-mentioned purpose A roller is arranged so that the imprint location of the image formation station of the specific color located in one of edges may be touched mostly. A means to carry out the variation rate of the conveyance belt by using the axis of this roller as the supporting point, and to make a conveyance belt estrange to the imprint location of other image formation stations while twisting a conveyance belt around this roller is established. It was made for the nip of the image support of a conveyance belt and a specific color not to change before and behind the variation rate by carrying out the variation rate of the axis of a roller for a conveyance belt as the supporting point at the time of monochrome image formation.

[0011] Suitably, the above-mentioned roller consists of imprint rollers.

[0012]

[Embodiment of the Invention] Hereafter, 1 operation gestalt of this invention is explained with reference to drawing 1.

[0013] Drawing 1 is the outline sectional view which applied this invention to the electrophotography method color copying machine. Four image formation stations (cyanogen) (C) 1, i.e., an image formation station, the image formation station (Magenta) (M) 1, the image formation station (yellow) (Y) 1, and the image formation station (black) (Bk) 1 are arranged in parallel and arranged in the body of a copying machine. The photo conductor drum 2 which is image support, respectively is formed in each image formation station 1 (C), 1 (M), 1 (Y), and 1 (Bk). By the electrification machine 3 uniformly charged in the photo conductor drum 2 around each photo conductor drum 2, the optical system 4 which scans a manuscript and exposes the image on the photo conductor drum 2, and exposure The development counter 5 which develops the formed electrostatic latent image, and the imprint electrification machine 6 which imprints the developed visible image to the imprint material 11 are arranged. However, the imprint roller 7 which serves as the driving roller of the conveyance belt 9 which replaces with the imprint electrification machine 6 and conveys the imprint material 11 is arranged in the black image formation station 1 (Bk). The conveyance belt 9 is twisted between the imprint rollers 7 and the follower rollers 8 which are a driving roller, and is driven in the direction of an illustration arrow head by rotation of a driving roller 7. Although illustration is omitted, the imprint power source is connected to the imprint roller 7 through suitable bias resistance, and it is supposed at it that the toner of a development counter 5 and the electrical potential difference of reversed polarity are impressed.

[0014] Moreover, it is located between the follower roller 8 and the image formation station 1 (C), and the cam 10 is arranged inside the conveyance belt 9. Two places of the abbreviation diameter direction of the periphery of this cam 10 touch the inner skin of the conveyance belt 9. When this cam 10 is in the 1st location shown in drawing 1 as a continuous line, the conveyance belt 9 Each image formation station 1 (C), The imprint location of the photo conductor drum 2 of 1 (M), 1 (Y), and 1 (Bk) is touched, and when it is in the 2nd location shown with a broken line, it is constituted so that the conveyance belt 9 may estrange from the imprint location of the photo conductor drum 2 of the image formation station 1

(C), 1 (M), and 1 (Y).

[0015] In drawing 1, the sheet paper cassette to which 12 contained the imprint material 11, the feed unit which 13 takes out one imprint material 11 at a time from a sheet paper cassette 12, and is sent out on the conveyance belt 9, the fixing assembly established in the visible image on the imprint material 11 by which 14 was discharged from the conveyance belt 9, and 15 are paper output trays which receive the discharged imprint material 11.

[0016] Next, actuation is explained. In the color copying machine of the above-mentioned configuration, when a cam 10 is in the 1st location shown as a continuous line, it is sent from the feed unit 13 and the sequential imprint of the image formed on the imprint material 11 adsorbed and conveyed on the conveyance belt 9 at each photo conductor drum 2 by each image station 1 (C), 1 (M), 1 (Y), and 1 (Bk) is carried out. While being in the condition that the conveyance belt 9 contacted the photo conductor drum 2 of all the image formation stations 1 (C), 1 (M), 1 (Y), and 1 (Bk) at this time, respectively proper imprint conditions are held. Then, it is sent to a fixing assembly 14, and is fixed to an imprint image, and the imprint material 11 is discharged on a paper output tray 15.

[0017] Next, in obtaining a black monochrome image using the image formation station 1 (Bk), as a cam 10 is rotated and a broken line shows, it carries out the variation rate of the conveyance belt 9 to drawing 1. By this, the conveyance belt 9 will be in the condition of having estranged from the photo conductor drum 2 of the image formation station 1 (C), 1 (M), and 1 (Y). In this condition, it is sent from the feed unit 13, and the imprint material 11 adsorbed and conveyed on the conveyance belt 9 will not contact in the photo conductor drum 2 of the image formation station 1 (C), 1 (M), and 1 (Y), but it will be sent to the imprint location of the image formation station 1 (Bk), and only the black image formed here will be imprinted on the imprint material 11 with the imprint roller 7. Since the physical relationship of the imprint material 11, the photo conductor drum 2, and the imprint roller 7 does not change at the image formation station 1 (Bk) also after the conveyance belt 9 has displaced, since the driving roller 7 of the conveyance belt 9 served as the imprint means at this time, a good imprint can be performed. It is fixed to the imprinted black image by the fixing assembly 14, and it is discharged on a paper output tray 15.

[0018] Thus, with this operation gestalt, since the imprint material 11 does not contact the photo conductor drum 2 of the image formation station 1 (C) which is not used at the time of monochrome image formation, 1 (M), and 1 (Y), the fault that wear out these photo conductor drums 2 that do not participate in black image formation, and endurance falls is removable. Moreover, if the driving force of the photo conductor drum 2 of the image formation station 1 (C), 1 (M), and 1 (Y) is cut and rotation is stopped, although illustration is not carried out, it can also remove the fault of wearing out the both sides of this blade and the photo conductor drum 2 by contact to the cleaning blade of each station, and the photo conductor drum 2. Furthermore, even when the variation rate of the conveyance belt 9 is carried out, since imprint conditions do not differ, it is not necessary to apply time and effort to tuning of conditioning.

[0019] Furthermore, it will be set to one of the factors from which the nip in which it is also formed on the conveyance belt 9 and the photo conductor drum 2 changes, if it is before and after displacement and the tension of a conveyance belt changes, when carrying out the variation rate of the conveyance belt 9. What is necessary is to be before and after displacement, and just to carry out a variation rate so that the belt perimeter may be made equal in order to make it not change a belt tension.

[0020] Then, when carrying out the variation rate of the conveyance belt 9 by rotation of a cam 10, the revolving-shaft core of the driving roller 7 of the conveyance belt 9 and the follower roller 8, and a cam 10 is arranged on 1 straight line, it is before and after rotation and it is desirable [a cam 10], as shown in drawing 2 to constitute so that it may be made to stop to said shaft axis in the location of the symmetry. Thereby, the amount L of displacement of the conveyance belt 9 becomes the same, the perimeter of the conveyance belt 9 is equal as a result, and a good imprint can be performed, without spoiling imprint conditions, even if the conveyance belt 9 displaces since a tension is not changing, either.

[0021] In addition, while arranging the imprint electrification machine 6 in each image formation station 1 (C), 1 (M), and 1 (Y) in the above-mentioned operation gestalt using the conveyance belt 9 which does

not function as an imprint means, respectively Although the imprint roller 7 of driving roller combination of the conveyance belt 9 was arranged in the image formation station 1 (Bk), the conveyance belt 9 is constituted from an imprint belt of imprint means combination, the imprint electric supply means against an imprint belt may be arranged in a suitable part, and the follower roller 8 may consist of usual rollers.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image formation equipment applied to a tandem process full colour copying machine, a printer, etc. of monochrome combination.

[0002]

[Description of the Prior Art] Although it is a best policy to stop image support, such as a photo conductor drum in the image formation station prepared for every color in the tandem process full color image formation equipment of monochrome combination, and the image support which is not used at the time of monochrome when the life of the conveyance belt which conveys imprint material is considered, and to make it evacuate from a conveyance belt, when an evacuation device is established about the image support of each image formation station, respectively, cost will start too much.

[0003] so, with the full color image formation equipment of the conventional monochrome combination For example, it sets to the image formation equipment which arranged the conveyance belt which passes through each image formation station and moves while arranging in parallel and arranging the image formation station of two or more colors as shown in JP,3-288173,A. Performing contact evasion of image support and a conveyance belt in the image formation station which does not participate in image formation at the time of monochrome image formation is proposed by supporting the whole conveyance belt by the cam, and changing the inclination by rotation of a cam.

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[0006] However, since the image support 31 of the image formation station 21 of a near specific color (Bk) and the clearance between the conveyance belts 26 are narrow, when the conveyance belt 26 is contacted by the image support 31 according to an operation of the backup strip 32 which carries out the operation which pushes the conveyance belt 26 against the image support 31, it consists of the supporting points so that an imprint may become possible.

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[0008] Furthermore, after a backup strip 32 is strong at the conveyance belt 26 rear face and forming the backup strip 32 which pushes the conveyance belt 26 against the image support 31 has carried out the pressure welding indispensable therefore, the conveyance belt 26 will move, and there was also a problem that the life of the conveyance belt 26 became short.

[0009] It aims at offering the image formation equipment which does not spoil imprint conditions by switch while this invention performs the pressure welding and evacuation change to the image support of a conveyance belt at the time of a switch of monochrome / multi-colored picture image formation, mitigates the load of a conveyance belt and image support in view of the above-mentioned conventional trouble and attains reinforcement.

[0010]

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[0014] Moreover, it is located between the follower roller 8 and the image formation station 1 (C), and the cam 10 is arranged inside the conveyance belt 9. Two places of the abbreviation diameter direction

of the periphery of this cam 10 touch the inner skin of the conveyance belt 9. When this cam 10 is in the 1st location shown in drawing 1 as a continuous line, the conveyance belt 9 Each image formation station 1 (C), The imprint location of the photo conductor drum 2 of 1 (M), 1 (Y), and 1 (Bk) is touched, and when it is in the 2nd location shown with a broken line, it is constituted so that the conveyance belt 9 may estrange from the imprint location of the photo conductor drum 2 of the image formation station 1 (C), 1 (M), and 1 (Y).

[0015] In drawing 1, the sheet paper cassette to which 12 contained the imprint material 11, the feed unit which 13 takes out one imprint material 11 at a time from a sheet paper cassette 12, and is sent out on the conveyance belt 9, the fixing assembly established in the visible image on the imprint material 11 by which 14 was discharged from the conveyance belt 9, and 15 are paper output trays which receive the discharged imprint material 11.

[0016] Next, actuation is explained. In the color copying machine of the above-mentioned configuration, when a cam 10 is in the 1st location shown as a continuous line, it is sent from the feed unit 13 and the sequential imprint of the image formed on the imprint material 11 adsorbed and conveyed on the conveyance belt 9 at each photo conductor drum 2 by each image station 1 (C), 1 (M), 1 (Y), and 1 (Bk) is carried out. While being in the condition that the conveyance belt 9 contacted the photo conductor drum 2 of all the image formation stations 1 (C), 1 (M), 1 (Y), and 1 (Bk) at this time, respectively proper imprint conditions are held. Then, it is sent to a fixing assembly 14, and is fixed to an imprint image, and the imprint material 11 is discharged on a paper output tray 15.

[0017] Next, in obtaining a black monochrome image using the image formation station 1 (Bk), as a cam 10 is rotated and a broken line shows, it carries out the variation rate of the conveyance belt 9 to drawing 1. By this, the conveyance belt 9 will be in the condition of having estranged from the photo conductor drum 2 of the image formation station 1 (C), 1 (M), and 1 (Y). In this condition, it is sent from the feed unit 13, and the imprint material 11 adsorbed and conveyed on the conveyance belt 9 will not contact in the photo conductor drum 2 of the image formation station 1 (C), 1 (M), and 1 (Y), but it will be sent to the imprint location of the image formation station 1 (Bk), and only the black image formed here will be imprinted on the imprint material 11 with the imprint roller 7. Since the physical relationship of the imprint material 11, the photo conductor drum 2, and the imprint roller 7 does not change at the image formation station 1 (Bk) also after the conveyance belt 9 has displaced, since the driving roller 7 of the conveyance belt 9 served as the imprint means at this time, a good imprint can be performed. It is fixed to the imprinted black image by the fixing assembly 14, and it is discharged on a paper output tray 15.

[0018] Thus, with this operation gestalt, since the imprint material 11 does not contact the photo conductor drum 2 of the image formation station 1 (C) which is not used at the time of monochrome image formation, 1 (M), and 1 (Y), the fault that wear out these photo conductor drums 2 that do not participate in black image formation, and endurance falls is removable. Moreover, if the driving force of the photo conductor drum 2 of the image formation station 1 (C), 1 (M), and 1 (Y) is cut and rotation is stopped, although illustration is not carried out, it can also remove the fault of wearing out the both sides of this blade and the photo conductor drum 2 by contact to the cleaning blade of each station, and the photo conductor drum 2. Furthermore, even when the variation rate of the conveyance belt 9 is carried out, since imprint conditions do not differ, it is not necessary to apply time and effort to tuning of conditioning.

[0019] Furthermore, it will be set to one of the factors from which the nip in which it is also formed on the conveyance belt 9 and the photo conductor drum 2 changes, if it is before and after displacement and the tension of a conveyance belt changes, when carrying out the variation rate of the conveyance belt 9. What is necessary is to be before and after displacement, and just to carry out a variation rate so that the belt perimeter may be made equal in order to make it not change a belt tension.

[0020] Then, when carrying out the variation rate of the conveyance belt 9 by rotation of a cam 10, the revolving-shaft core of the driving roller 7 of the conveyance belt 9 and the follower roller 8, and a cam 10 is arranged on 1 straight line, it is before and after rotation and it is desirable [a cam 10], as shown in drawing 2 to constitute so that it may be made to stop to said shaft axis in the location of the symmetry. Thereby, the amount L of displacement of the conveyance belt 9 becomes the same, the

perimeter of the conveyance belt 9 is equal as a result, and a good imprint can be performed, without spoiling imprint conditions, even if the conveyance belt 9 displaces since a tension is not changing, either.

[0021] In addition, while arranging the imprint electrification machine 6 in each image formation station 1 (C), 1 (M), and 1 (Y) in the above-mentioned operation gestalt using the conveyance belt 9 which does not function as an imprint means, respectively Although the imprint roller 7 of driving roller combination of the conveyance belt 9 was arranged in the image formation station 1 (Bk), the conveyance belt 9 is constituted from an imprint belt of imprint means combination, the imprint electric supply means against an imprint belt may be arranged in a suitable part, and the follower roller 8 may consist of usual rollers.

[0022]

[Effect of the Invention] According to the image formation equipment of this invention, a conveyance belt by carrying out the variation rate of the axis of a roller as the supporting point at the time of monochrome image formation so that clearly from the above explanation Since it is before and after the displacement and he is trying for the nip of the image support of a conveyance belt and a specific color not to change While being able to perform the pressure welding and evacuation change to the image support of a conveyance belt at the time of a switch of monochrome / multi-colored picture image formation, being able to mitigate the load of a conveyance belt and image support and being able to attain reinforcement Imprint conditions cannot be spoiled in that case and a proper image can be formed by the easy configuration and the tuning activity.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the sectional view showing the outline configuration of 1 operation gestalt of the image formation equipment of this invention.

[Drawing 2] They are the driving roller in this operation gestalt, a follower roller, and the arrangement-related explanatory view of a cam.

[Drawing 3] It is the sectional view of the image formation equipment of the conventional example.

[Drawing 4] It is a partial expanded sectional view explaining the trouble of the example of *****.

[Description of Notations]

1 (C) Image formation station

1 (M) Image formation station

1 (Y) Image formation station

1 (Bk) Image formation station

2 Photo Conductor Drum (Image Support)

7 Imprint Roller (Driving Roller)

9 Conveyance Belt

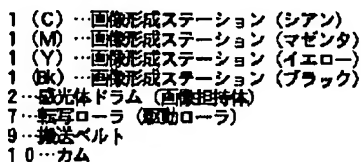
10 Cam

[Translation done.]

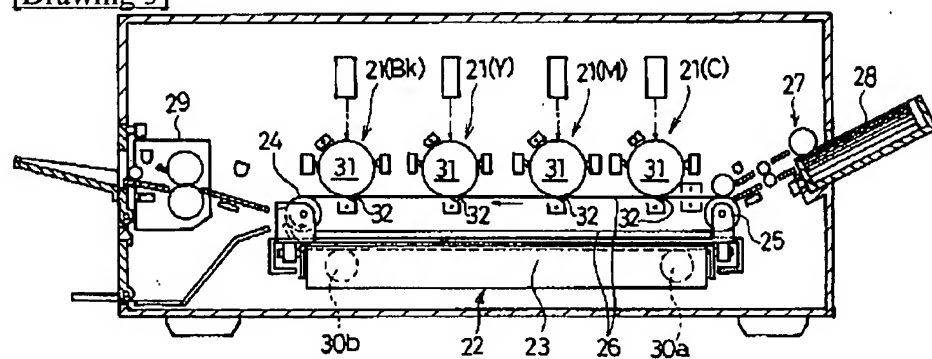
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[Drawing 1]



[Drawing 3]



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